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135 316 Kedabek copper mines. *Graphite* and *mercury* have recently been found. *Pyrites* is worked for sulphur in Elisavetopol and Tiflis, and sulphur is also obtained at Bechenakh and Gunur, in Kutais.

(5) Mineral Oils

(*a*) *Sources of Supply*

135 315 Mineral oil, the great source of Caucasian wealth, is found chiefly in the Governments of Baku, Terek, and Kuban, although small quantities occur elsewhere. Hitherto by far the richest oil-producing area has been that of Baku, comprising the Apsheron Peninsula, Cheleken Island and Holy Island, and the outlying district of Benagadi. In the Apsheron Peninsula lie the older oil-fields: the five belts of Balachani, Sabunchi, Romani, Bibi-Ebyat, and Zabrat, and the comparatively newly-discovered oil district of Surachani, about 12 miles away. Second to those of Baku in importance and apparently of increasing productivity are the Grozni fields in Terek Province. The Maikop oil-fields, in Kuban Province, have since 1912 yielded unsatisfactorily.

In 1908 the Caucasian oil-fields supplied about 22 per cent. of the world's total production, but the proportion has sunk very considerably since then. General figures of the output from 1910 to 1916 are given in Table II of the Appendix (p. 93).

382 The products of the mineral oil include illuminating oils, engine and cylinder oils, solar oils, goudron (asphalt), benzene, residuum (*ostotki*), and crude oil (untreated). Of these, *ostotki* was for years treated as waste, but it is now by far the largest product, having superseded kerosene, which bears a heavy duty, while *ostotki* is untaxed; it has a large sale as fuel for factories, railways, and steamships. Balachani oil is the heaviest in quality; *ostotki* is not so readily formed from the Bibi-Ebyat and Grozni products. Cheleken Island and Telav produce ozokerite (or paraffin wax). The lowest percentage of benzene

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is yielded by Balachani. Grozni oil is particularly adapted for the manufacture of first grade petrol, great quantities of which have accumulated there during the war.

The following particulars may be given of the chief oil-fields:

(i) *The Baku Fields.*—The first well was bored at Baku in 1871. Since that year the oil-fields have been developed one after another, with capital supplied partly by the Swedish firm of Nobel Brothers, and partly by the French Rothschilds and others. The Balachani–Sabunchi–Romani field occupies about 2,640 acres on a plateau a few miles from the Caspian Sea.[1] At Sabunchi eight very productive belts are known. At Romani there was a natural depression into which ran the water and refuse from adjoining properties, forming a lake of 432 acres; this was drained in 1904 by the Moscow Caucasian Co., by means of a subterranean channel, and an outlet into the Caspian Sea was also provided, which serves as a permanent drain for the whole oil-field. Bibi-Ebyat contains five rich belts, but its productivity is declining. Puta, a continuation of the Bibi-Ebyat fields, has been very little developed. Zabrat has been prospected by a French company, but the yield is only spasmodic.

Between 1908 and 1911 there was a marked decrease in production in all but one of the old Baku oil-fields, as seen by the following comparative table:

	Balachani.	*Sabunchi.*	*Romani.*	*Bibi-Ebyat.*	*Total.*
	Metric tons.	Metric tons.	Metric tons.	Metric tons.	Metric tons.
1908	1,124,784	3,181,936	1,222,304	1,914,128	7,443,152
1911 [2]	755,200	2,131,200	1,019,200	1,225,600	5,131,200

After 1911, in spite of new borings, the production, though increased, did not reach the 1908 level, whilst after 1914 the Surachani output is reckoned in with the old Baku output, and the separate yield of the original oil-fields cannot therefore be calculated. There

[1] On this plateau 120,000,000 gallons of oil were thrown up in 1873 before it was understood how to conserve it.

[2] Ten months only.

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228 The *caviare* industry of the Caspian littoral is declining, but is still important (see p. 62).

339 *Cement* is made at Novorossiisk, Gelendjik, Tuapse, and Yeisk. It is used for lining oil wells, and also for harbour works and other purposes. There were nine large cement factories at Novorossiisk in 1917, with an annual output of 4,600,000 barrels, the most important being the Black Sea Cement Manufactory, the Franco-Russian Cement Manufactory, and the Zep Cement Works.

282 *Leather-work* is a fairly extensive industry, of which the chief centres are Alexandropol, Elisavetopol, Shusha, and Tiflis. Tanning is done at Tiflis, and saddlery is well made in Daghestan and the Black Sea districts.

391 *Metallic and Allied Industries.*—The copper and zinc smelting works have already been mentioned (see pp. 63–64 and 67). There are iron foundries at Ekaterinodar, Baku, Tiflis, Batum, and Armavir. 'Colonist' reaping machines are made at Novorossiisk, and galvanized iron roofing and hardware goods at a factory at Baku. Among manufactures subsidiary to the oil industry are those of oil-cases and oil-cans, carried on at Baku and Batum, and of wire rope, carried on at several factories at Baku. The manufacture of small-arms, once a flourishing industry, is declining, but is still carried on at Tiflis and Nukha and in the bazaars of Daghestan and Sukhum. The number of skilled native workers in enamel, filigree, and inlaid metal-ware is also decreasing.

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256 The *milling* industry is second in importance only to the refining of oil. There are many flour-mills worked by water-power; those in Stavropol produce 300,000 tons of flour per annum, and those in Kuban, about the same amount; the mills of the Black Sea district give some 20,000 tons yearly. Besides the flour-mills, there are also mills for crushing sunflower seed, linseed, and cotton seed.

382 The *oil refineries* are the most important manufacturing enterprises in the country. They exist at Baku,

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Grozni, and Ekaterinodar, and, on a smaller scale, at 382
Armavir. There are a number of large refineries at Black Town, near Baku, where crude oil is refined to produce kerosene. In 1914 the oil products received from the stills amounted to 4,354,000 tons, while in 1916 there were nearly 5,000 men employed. At Ekaterinodar the oil from Maikop is treated, and the decline in the production from that field has greatly reduced the industry there.

Potash is made in Kuban from sunflower stalks, and 385
in 1910 a combine of eighteen firms of potash manufacturers was formed. The industry has doubtless been affected by the decline of sunflower cultivation (p. 54).

Of the *textile industries*, which are in a very backward 288
state, silk-weaving and carpet-making are the most 286
highly developed. Silk is woven at Tiflis, and since the revival of sericulture, steam silk-mills have been started at Shusha and in the Elisavetopol Government. Felt and carpets are made at home by women—chiefly at Shusha, but also at Akhaltsikh, Akhalkalaki, Gadrut, Kasapet, and Kubrassy—with wool bought from the Tatars. Both hand-knitted and woven woollen goods are made. Cotton is spun at Tiflis and Akhaltsikh, and a rough cotton stuff called *khami* and a little linen of indifferent quality are woven by hand.

There are seventeen *tobacco* factories in Caucasia, 277
six being in Tiflis, four in Kuban, two in Daghestan, two in Baku, two in Sukhum, and one in Terek. The industry is controlled by a dozen large firms, and the output in 1914 was 2,395 tons.

Wine-making and Distilling.—There is a good deal of 274
wine made, especially in the Province of Kutais; the best quality is produced in the Gelendjik district, and Echmiadzin is one of the great centres. The best known type of wine is the Riesling. At Abrau, a Crown estate near Novorossiisk, is made the Abrau-Dursan champagne, which is considered equal to a good French champagne. The total output of wine in Caucasia was 27,449,350 gallons in 1911 and nearly

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giving waters. In the Northern Caucasus Essentuki, Piatigorsk, Kislovodsk and Zhelesnovodsk were the favourite resorts. In Transcaucasia Borjom, in the Government of Tiflis, an appanage of the Grand Duke Nicholas Nicholaevich, was the most popular resort, and its waters, rich in carbonic acid and comparable with those of Vichy, were exported to Russia, Western Europe and America—in 1913 to the amount of 9,000,000 bottles.

At Abas-Tuman, 40 miles from Borjom, and at Tiflis are hot baths, efficacious for the cure of skin diseases, nervous diseases, rheumatism, etc. Some of the springs contain the same qualities as Cauterets and Barèges in France, and Baden in Austria, while the climate of Abas-Tuman attracts consumptive patients.

Tskhalkubo, near Kutais, possesses warm springs whose radio properties are declared to be equal to those of Teplitz-Schönau in Bohemia. For this resort is prophesied an important future as soon as the nature of the waters is more widely known, and ordered conditions make it accessible to the timid invalids of Western Europe and America.

Petroleum (1) The Baku Fields.—The Baku area has hitherto been the most productive source of Caucasian oil. The older oil-fields lie in the Apsheron Peninsula—Balakhani, Sabunchi, Romani, Bibi-Ebyat and Zabrat—while there is a more recently discovered field at Surakhani. The outlying district of Benagadi and Holy and Cheleken Islands in the Caspian, are also worked by the Baku firms. The Baku fields had been exploited since ancient times, and from 1813 some attempt had been made by the Russians to develop their potentialities. An onerous concession system, however, discouraged private enterprise, and when, in the middle of the nineteenth century, a universal demand for crude-oil was created, the fields still remained almost untouched, and Russia became dependent on oil imported from America. In 1872 the concession system was at last abolished, and State participation in the profits was ensured by the imposition of an excise duty. Later, the nascent industry was further assisted by the imposition of a duty on oil imported into Russia.

In 1873 the Swedish Nobel Brothers commenced to bore in the Apsheron fields, and in the following years many foreign groups, principal of which were the French Rothschilds, obtained concessions. In 1908 the prosperity of the Baku fields reached its zenith, and in that year the Caucasian oil-fields together produced 22 per cent. of the world's output. Between 1908 and 1911, however, there took place a serious decrease, the output falling from nearly 7,500,000 metric tons in 1908 to just over 5,000,000 metric tons in 1911.

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But in 1914, while the production of the older wells was still decreasing, the newly exploited field of Benagadi was giving a steadily increasing output; and it is unquestionable that the oil-deposits of the South-eastern Caucasus are by no means exhausted, and many rich areas remain to be prospected and exploited.

(2) The Grozni Fields.—The petroliferous area round Grozni had been worked for some years to supply local needs when, in 1893, the European Petrol Company, a British concern, commenced scientific exploitation. The oil-bearing area, at present developed, covers an area of about 2,500 acres, while new areas in the neighbourhood have been prospected for a radius of about 30 miles. The whole district is believed to be extremely rich in petroleum products, and experts consider that its output may eventually rival that of Baku. The Kazbek Syndicate and the Anglo-Terek Co., both British concerns, also own important holdings.

(3) The Maikop Fields, originally exploited by British capital in 1908, have proved disappointing. The output has steadily declined since 1912, and little oil has been available for export, the bulk being consumed locally.

Other petroliferous areas are known to exist in the regions of Shemakha, Jevad, Lenkoran, Telav and Ozurgeti.

Export and Import Trade.—The bulk of the trade of Transcaucasia was, before the war, carried on with other parts of the Russian Empire, by Batum and Poti to the South Russian ports, and by Baku to Astrakhan and Central Asia. Further Transcaucasia enjoyed the benefits of a growing transit trade between the Mediterranean countries and Russia on the one hand, and Persia and Central Asia on the other.

The Transcaucasus exported into Russia the whole of the copper produced and a proportion of the manganese, together with the bulk of the production of tobacco, tea, raw silk and cocoons, wine, wool and fruit. In return Russia exported into the Transcaucasus machinery and other metal goods and cereals, supplying one-fifth of the consumption of grain in the Transcaucasus. This last item is significant, for it implies the partial dependence of the Transcaucasus, itself an agricultural country, on Russia for food-supply.[1]

On the other hand the Transcaucasus exported to Europe,

[1] "Somme toute, la balance de l'industrie rurale accusait, en Géorgie, avant la guerre, plutôt des déficits que des excédents; le manque de blé n'était pas compensé par un surplus des autres branches de l'agriculture" (V. Vohtinsky, *La Démocratie Géorgienne*).

311 433 located around Novorossiysk. The wine industry is also centered around Novorossiysk. The only sub-unit of the kray, the Adyge AO, is highly industrialized. The main industry is the oil industry. Of smaller importance are metallurgy and machinery, and the lumbering, food, and tobacco industries.

Rostov Oblast: Since the detachment from the oblast of the coal-mining areas, its industry consists mostly of various machinery plants concentrated at Rostov, Taganrog, and Novocherkassk.

The distribution of the various industries in the Caucasus is as follows:

315 382 Oilfields, centers of oil industry: The oilfields and the oil industry arising from them are the main assets of the Caucasian economy. Of the five oilfields, two are in the South, and three in the North Caucasus. The greatest is the Baku oilfield. The importance of this oilfield is however declining; its output, which constituted 83% of the Russian output in 1913, had fallen to 48 in 1950. Due to the 85 years of exploitation, the wells are very deep and mostly on the bottom of the Caspian Sea. The output is refined mostly in the cracking plants of Baku or sent through two pipelines to Batumi. The second important oilfield of the Caucasus is located around Groznyy. The product of this oilfield furnishes mostly high-octane aviation gasoline. The Groznyy product is either processed in the cracking plants of Groznyy and Malgobek, or piped to the cracking plants of Tuapse, or to Trudovaya in the Donets Basin. The Makhachkala products, however, are refined mostly in Makhachkala itself. The fourth center

315 382 of Caucasian oil production, the oilfields around Maykop, are richer than those of Makhachkala, though they have not yet fully recovered from the German destruction. The main center of these fields is Maykop. The Maykop product is refined in Maykop, or sent by pipes to the Krasnodar, Tuapse, or Trudovaya refineries. The fifth oilfield is the Shirako oilfield (in eastern Georgia), whose exploitation began only recently. The Shiraki product is processed in the Mirzaani cracking plants. The oil of the Caucasian fields is sometimes used as fuel for thermo-electric plants.

315 Natural gas centers: Though gas occurs around the oilfields at various places, large-scale industrial exploitation is confined to the methane gas wells of Dagestanskie Ognie where it is used for fuel in the glassworks.

316 Coal mines: This very important fuel, if one disregards the mines located in the northern Rostov Oblast, is scarce in the Caucasus. Only Georgia has really important coal mines, of which the Tkibuli and Tkvarcheli mines produce coking coal, whereas the Akhaltsikhe mines produce brown coal. In the North Caucasus, the Rostov coal mines are a continuation of the Donets Basin coal-producing area; they contribute 10% of its output and contain roughly 20% of the Donets Basin reserves. Caucasian coal is very often used as fuel for thermo-electric plants, the most important of which is the Artemovskiy Plant (90,000kw).

377 Water resources and hydro-electric plants: The Caucasus is extremely rich in water resources. Half of the water resources of

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b. 2 Centers of Oil Industry

Until 1936 Transcaucasia formed a single political unit: the Transcaucasian Soviet Federated Socialist Republic, then one of the union republics of the USSR. With the promulgation of the 1936 Constitution, this federated republic was split up into its primary components based on the three principal nationalities: Armenian, Azerbaijan, and Georgian SSR's. Minor nationalities, such as Abkhaz, Adzhars, and Ossetians, are organized into lesser autonomous units such as autonomous SSR's or autonomous oblasts.

Petroleum is the most important single asset of Transcaucasia. The Baku oil region of world-wide significance is the principal petroleum producer of the USSR, furnishing more than one half the total output. Pipe lines for crude oil, kerosene, and other petroleum products lead from Baku across the entire region to Batumi on the Black Sea, next to Baku, the principal oil port and refining center of Transcaucasia. Before the Second World War the petroleum industry accounted for two fifths of all factory workers, two thirds of the use of electric energy, more than one half the industrial production, and almost two thirds of the exports of Transcaucasia. Since then, however, the creation of new industries and the increase of electric power sources have reduced the relative importance of this branch of the economy. Among the other important power resources are the coal mines of Tkibuli and Tkvarcheli in Georgia, especially the reserves of hydroelectric power, which equal the reserves of the European part of the USSR. Among the most important metal deposits are the manganese mines of Chiatura (Georgia), the second largest in the world, copper in Armenia, and iron in Azerbaijan.

Manufacturing industries are mainly devoted to the processing of the local agricultural products: fruit canning, wine-making, distilling, and cotton ginning. Azerbaijan has a well-developed textile industry, and many of the precious woods are used in wood-working plants. Heavy metallurgy is represented by the steel mills of Rustavi (Georgia) and the ferro-manganese works of Zestafoni (Georgia), and there are machinery plants in many of the large cities. Chemicals and cement are also produced.

In connection with the varied natural conditions and under the influence of the vertical zoning in the mountains, all rural economy forms are represented—from orchard farming in the irrigated sections to nomadic livestock raising in the drier areas. The land is divided according to usability as follows: one fifth is arid, due to the presence of rocks, sands, or marshes; another fifth is forested; more than one third is